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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,553	08/02/2003	Marcos Kamezos	CPAC 1017-6 D4	2573
22470	7590	04/26/2005	EXAMINER	
HAYNES BEFFEL & WOLFELD LLP P O BOX 366 HALF MOON BAY, CA 94019			NGUYEN, DAO H	
			ART UNIT	PAPER NUMBER
			2818	

DATE MAILED: 04/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	<b>Application No.</b> 10/632,553	<b>Applicant(s)</b> KARNEZOS, MARCOS	
	<b>Examiner</b> Dao H. Nguyen	<b>Art Unit</b> 2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 April 2005.  
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-40 is/are pending in the application.  
4a) Of the above claim(s) 20-38 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-19, 39 and 40 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 02 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>0104 - 0105</u> . | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. In response to the communications dated 08/02/2003 through 04/08/2005, claims 1-40 are active in this application.

### Acknowledges

2. Receipt is acknowledged of the following items from the Applicant.

Information Disclosure Statements (IDS) filed on 01/16/2004, 04/28/2004, 08/04/2004, 10/18/2004, 01/03/2005, 01/10/2005. The references cited on the PTOL 1449 forms have been considered.

Applicant is requested to cite any relevant prior art if being aware on form PTO-1449 in accordance with the guidelines set for in M.P.E.P. 609.

3. Applicant made a provisional election to prosecute the invention of Group I, claims 1-19 and 39-40, drawn to semiconductor devices. Affirmation of this election was made in the Response to Restriction Requirement, and made of record as Paper filed 04/08/2005.

Because Applicant did not distinctly and specifically point out the supposed error in the restriction requirement, the election has been treated as an election **without traverse** (MPEP § 818.03(a)).

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Claims 20-38 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a non-elected group there being no allowable generic or linking claim.

Applicant has the right to file a divisional application covering the subject matter of the non-elected claims.

4. This application claims benefit of Provisional Application No. 60/411,590 filed 09/17/2002.

### **Specification**

5. The specification has been checked to the extent necessary to determine the presence of possible minor errors. However, the applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### **Claim Objections**

6. The claim is objected to because of the following reasons:

Claim 1 recites the limitation "the first and second substrates" in line 2. There is insufficient antecedent basis for this limitation in the claim.

### **Claim Rejections - 35 USC § 102**

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claim(s) 1-19 and 39-40 is/are rejected under 35 U. S. C. § 102 (e) as being anticipated by U.S. Patent No. 6,621,169 to Kikuma et al.

Regarding claim 1, Kikuma discloses a multi-package module, as shown in figs. 10, 12-17, comprising stacked first package including a first die 72 attached to a first substrate 26; and a second package including a second die 74 attached to a second substrate 76, wherein the first and second substrates 26/76 are interconnected by wire bonding 84, and wherein the first package comprises a flip-chip ball grid array package having a flip-chip in a die-down configuration (fig. 15B).

Regarding claim 2, Kikuma discloses the multi-package module wherein the second package is a wire bonded land grid array package. See figs. 15B.

Regarding claim 3, Kikuma discloses the multi-package module wherein the die and wire bonds in the second package are fully encapsulated with a molding material 40.

Regarding claim 4, Kikuma discloses the multi-package module wherein the second package is peripherally encapsulated by encapsulant 40 to an extent sufficient to cover the wire bonds between the die and the substrate. See fig. 15B.

Regarding claims 5-19 and 39-40, Kikuma discloses the multi-package module comprising all claimed limitations. See figs. 10-26 and col. 16, line 10-51; col. 18, lines 34-48.

9. Claim(s) 1, 6-7, 10-13, 17-19 are rejected under 35 U. S. C. § 102 (b) as being anticipated by U.S. Patent No. 5,903,049 to Mori.

Regarding claim 1, Mori discloses a multi-package module, as shown in figs. 1, 3, comprising stacked first and second packages 6b/6a, each said package including die 1b/1a attached to a substrate 2b/2a respectively, wherein the substrates 2b/2a are interconnected by wire bonding 7, and wherein the first package 6b comprises a flip-chip ball grid array package having a flip-chip in a die-down configuration.

Regarding claim 6, Mori discloses the multi-package module wherein the flip chip package is provided with an electrical shield 5/10. See figs. 1-4.

Regarding claim 7, Mori discloses the multi-package module wherein the electrical shield is configured to serve as a heat spreader. See col. 4, lines 16-27.

Regarding claim 10, Mori discloses the multi-package module wherein the first package is provided with an electrical shield 5/10. See figs. 1-4.

Regarding claim 11, Mori discloses the multi-package module wherein the second package is a stacked die package. See figs. 1-4.

Regarding claim 12, Mori discloses the multi-package module wherein adjacent stacked die in the stacked die package are separated by spacers. See figs. 1-4.

Regarding claim 13, Mori discloses the multi-package module wherein the second package is stacked over the first package, and wherein the flip-chip die on the first package is provided with an electrical shield 5/10. See figs. 1-4.

Regarding claims 17-19, Mori discloses the multi-package module comprising all claimed limitations.

### **Claim Rejections - 35 U.S.C. § 103**

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to

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a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claim(s) 2-5, 8-9, 14-16, 39-40 are rejected under 35 U.S.C. 103 (a) as being unpatentable over U.S. Patent No. 5,903,049 to Mori, in view of the following remarks.

Regarding claim 2, though in figs. 1 and 3, Mori does not teach the multi-package module wherein the second package is a wire bonded land grid array package.

However, in fig. 4, More does discuss about a package module having a substrate 8 and a die 1 attached to the substrate 8 by a wire bonded land grid array, and the advantage of this module is that the mounting area of the die 1, and also the weight of the package may be reduced. See col. 1, lines 25-30.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of More described in figs. 1, 3 so that the second package is a wire bonded land grid array package as that shown in fig. 4 in order to obtain the above advantage; furthermore, such modification would decrease pressure applied on the first package due to a decrease in weight of the first package.

Regarding claim 3, Mori discloses the multi-package module wherein the die and wire bonds in the second package are fully encapsulated with a molding material 10.

See figs. 1-4.

Regarding claim 4, Mori discloses the multi-package module wherein the second package is peripherally encapsulated to an extent sufficient to cover the wire bonds between the die and the substrate. See figs. 1-4.



Regarding claim 5, Mori discloses the multi-package module wherein the second package substrate is a single-metal layer substrate. See figs. 1-4. Note that the substrates of Mori obviously can be any suitable material, depending on the choice of the designer.

Regarding claims 8-9, Mori discloses the multi-package module wherein the flip chip package includes an RF die, and the shield serves to limit electromagnetic interference between the RF die and other die in the multi-package module. This is an obvious matter because the die can be any die, depending on the desired application. In addition, the encapsulant resin 5/10 are purposed to protect the enclose from external effects, which including electromagnetic interference.

Regarding claims 14-16, Mori discloses the multi-package comprising all claimed limitations. Note that it is inherent and well known in the art that the metal substrate should be grounded to avoid any possible capacitive influence or electrical effect to the die attached to it. Furthermore, any of such metal substrate would be a great mean for heat dissipation.

Regarding claims 39-40, Mori discloses a multi-package module which obviously can be used in any suitable device or system, including mobile communications device, or a computer system.

### Conclusion


12. A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to become abandoned (see M.P.E.P 710.02(b)).

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dao H. Nguyen whose telephone number is (571)272-1791. The examiner can normally be reached on Monday-Friday, 9:00 AM – 6:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571)272-1787. The fax numbers for all communication(s) is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)272-1625.



Dao H. Nguyen  
Art Unit 2818  
April 18, 2005



David Nelms  
Supervisory Patent Examiner  
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